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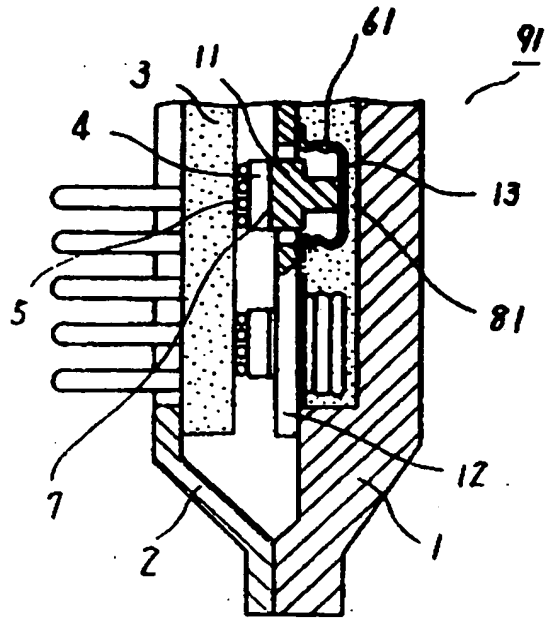
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APPLICANT : HITACHI LTD;

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TITLE : SEMICONDUCTOR COOLING DEVICE



**ABSTRACT :** **PURPOSE:** To offer the title device which can enhance the cooling efficiency by absorbing the heat generation of a semiconductor chip and block the leakage of cooling material sealed in the bellows.

**CONSTITUTION:** Required semiconductor chips 4, 4... are fixed on the surface of a ceramic substrate 3 respectively via solder balls 5, 5.... On the other hand, a plate 12 is fixed on the stepwise difference surface of the inside end of a heat sink 1, having holes corresponding to the chips 4, and the bellows 61 made of copper or nickel is fixed to the hole corresponding to the chip 4 in the plate 12 by a suitable means. Besides, a stud 11 is fixed inside integrally by welding, its tip being press-contacted with the chip 4 by the compression force of the bellows 61. The mixture of gallium-indium-tin alloy of a liquid metal, and helium or nitrogen gas is sealed as the cooling material 81 among the heat sink 1, plate 12, and bellows 61, thus functioning as the pressure to the chip 4, together with the spring force of the bellows.

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